

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims:

Claims 1-42 (Canceled).

Claim 43 (Currently Amended): An object extraction apparatus for extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, comprising:

region segmentation means for dividing said object image into a plurality of regions; and

extraction means for identifying and extracting the object portion in said object image by a process of consolidating information of each pixel in said object image ~~each~~ for each said region,

wherein said process of consolidating information of each pixel in said object image ~~each~~ for each said region in said extraction means is the process of averaging information of each pixel in said object image ~~each~~ for each said region.

Claims 44 - 46 (Canceled).

Claim 47 (Currently Amended): An object extraction apparatus for extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, comprising:

region segmentation means for dividing said object image into a plurality of regions; and

extraction means for identifying and extracting the object portion in said object image by a process of consolidating information of each pixel in said object image ~~each~~ for each said region, wherein said extraction means comprises

difference processing means for carrying out a difference process between a background image obtained by shooting only a background of said object of interest and said object image;

mean value obtaining means for obtaining a mean value of absolute values of difference obtained by said difference process in said each region, and

threshold value processing means for comparing said mean value of absolute values of difference in said region with a predetermined value to extract a region having said mean value of at least said predetermined value as the object portion.

Claim 48 (Currently Amended): An object extraction apparatus for extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, comprising:

region segmentation means for dividing said object image into a plurality of regions; and

extraction means for identifying and extracting the object portion in said object image by a process of consolidating information of each pixel in said object image ~~each~~ for each said region,

wherein said extraction means comprises

mean value calculating means for calculating a mean value of pixels in each region of said object image,

difference processing means for carrying out a difference process between a mean value of pixels in each region of said object image and a mean value of pixels in a region of said background image corresponding to said region of said object image, and

threshold value processing means for comparing an absolute value of difference obtained by said difference processing means with a predetermined value to extract a region having said absolute value of difference of at least said predetermined value as the object portion.

Claim 49 (Canceled).

Claim 50 (Currently Amended): An object extraction method for extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, comprising:

a region segmentation step of dividing said object image into a plurality of regions; and

an extraction step of identifying and extracting the object portion in said object image by a process of consolidating information of each pixel in said object image ~~each~~ for each said region,

wherein said step of consolidating information of each pixel in said object image ~~each~~ for each said region in said extraction step is the process of averaging information of each pixel in said object image ~~each~~ for each said region.

Claims 51 - 53 (Canceled).

Claim 54 (Currently Amended): An object extraction method for extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, comprising:

a region segmentation step of dividing said object image into a plurality of regions; and

an extraction step of identifying and extracting the object portion in said object image by a process of consolidating information of each pixel in said object image ~~each~~ for each said region,

wherein said extraction step comprises

a difference processing step of carrying out a difference process between a background image obtained by shooting only a background of said object of interest and said object image,

a mean value obtaining step of obtaining a mean value of absolute values of difference obtained by said difference process in said each region, and

a threshold value processing step of comparing said mean value of absolute values of difference in said region with a predetermined value to extract a region having said mean value of at least said predetermined value as the object portion.

Claim 55 (Currently Amended): An object extraction method for extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, comprising:

a region segmentation step of dividing said object image into a plurality of regions; and
an extraction step of identifying and extracting the object portion in said object image by a process of consolidating information of each pixel in said object image ~~each~~ for each said region,
wherein said extraction step comprises
a mean value calculating step of calculating a mean value of pixels in each region of said object image,
a difference processing step of carrying out a difference process between a mean value of pixels in each region of said object image and a mean value of pixels in a region of said background image corresponding to said region of said object image, and
a threshold value processing step of comparing an absolute value of difference obtained by said difference processing with a predetermined value to extract a region having said absolute value of difference of at least said predetermined value as the object portion.

Claim 56 (Canceled).

Claim 57 (Currently Amended): A medium storing a program for causing a computer to extract an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, said program comprising:

a region segmentation step of dividing said object image into a plurality of regions; and
an extraction step of identifying and extracting the object portion in said object image by a process of consolidating information of each pixel in said object image ~~each~~ for each said region,
wherein said process of consolidating information of each pixel in said object image ~~each~~ for each said region in said extraction step is the process of averaging information of each pixel in said object image ~~each~~ for each said region.

Claims 58 - 60 (Canceled).

Claim 61 (Currently Amended): An medium storing the object extraction program for causing a computer to extract an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, said program comprising:

a region segmentation step of dividing said object image into a plurality of regions; and
an extraction step of identifying and extracting the object portion in said object image by a process of consolidating information of each pixel in said object image ~~each~~ for each said region,
wherein said extraction step comprises
a difference processing step of carrying out difference processing between a background image obtained by shooting only a background of said object image and said object image,
a mean value obtaining step of obtaining a mean value of absolute values of difference obtained by said difference process in said each region, and
a threshold value processing step of comparing said mean value of an absolute values of difference in said region with a predetermined value to extract a region having said mean value of at least said predetermined value as the object portion.

Claim 62 (Currently Amended): An medium storing the object extraction program for causing a computer to extract an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, said program comprising:

a region segmentation step of dividing said object image into a plurality of regions; and

an extraction step of identifying and extracting the object portion in said object image by a process of consolidating information of each pixel in said object image ~~each~~ for each said region,

wherein said extraction step comprises

a mean value calculating step of calculating a mean value of pixels in each region of said object image,

a difference processing step of carrying out a difference process between a mean value of pixels in each region of said object image and a mean value of pixels in a region of said background image corresponding to said region of said object image, and

a threshold value processing step of comparing an absolute value of difference obtained by said difference processing step with a predetermined value to extract a region having said difference absolute value of difference of at least said predetermined value as the object portion.

Claim 63 (Canceled).

Claim 64 (Currently Amended): An object extraction apparatus for extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, comprising:

depth information calculating means for calculating depth information of said object image;
region segmentation means for dividing said object image into a plurality of regions;

mean value calculating means for calculating a mean value of said depth information ~~each~~ for each said region; and

extraction means for extracting as said object portion a region having said mean value smaller than a predetermined threshold out of said plurality of regions.

Claim 65 (Currently Amended): An object extraction method of extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, comprising the steps of: calculating depth information of said object information, dividing said object image into a plurality of regions, calculating a mean value of said depth information ~~each~~ for each said region, and extracting as said object portion a region having said mean value smaller than a predetermined threshold out of said plurality of regions.

Claim 66 (Currently Amended): A medium storing a program for causing a computer to extract an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, said program comprising the steps of: calculating depth information of said object information; dividing said object image into a plurality of regions; calculating a mean value of said depth information ~~each~~ for each said region; and extracting as said object portion a region having said mean value a smaller than a predetermined threshold out of said plurality of regions.

Claim 67 (Previously Presented): An object extraction apparatus for extracting an object portion by removing a background portion from an object image obtained by shooting an object of interest on the basis of said object image and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, comprising:

difference means for calculating an absolute value of difference between said object image and said background image;

extraction means for extracting a portion of said object image as said object portion if said absolute value of difference is greater than a threshold value; and

threshold value determination means for determining said threshold value in a statistical manner according to image information distribution of said plurality of background images.

Claim 68 (Previously Presented): An object extraction apparatus for extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, on the basis of said object image and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, comprising:

calculating means for calculating a mean value and standard deviation of pixels located at same coordinates in said plurality of background images each for said pixel;

difference means for calculating an absolute value of difference between a value of each pixel in said object image and a mean value of pixels in said background image corresponding to said pixel; and

extraction means for extracting a pixel out of the pixels in said object image as said object portion if said absolute value of difference is greater than a predetermined number times said standard deviation.

Claim 69 (Currently Amended). An object extraction apparatus for extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, on the basis of said object image and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, comprising:

average/standard deviation calculating means for calculating a mean value and standard deviation of pixels located at the same coordinates in said plurality of background images each for said pixel,

region segmentation means for dividing said object image into a plurality of regions;

difference means for calculating an absolute value of difference between a value of each pixel in each region of said object image and a mean value of corresponding pixels in a region of said background image corresponding to said region;

mean difference calculating means for calculating a mean value of said absolute values of difference ~~each~~ for each said region;

mean standard deviation calculating means for calculating a mean value of said standard deviation ~~each~~ for each said region; and

extraction means for extracting a region out of said plurality of regions as said object portion if a mean value of said absolute values of difference is greater than a predetermined number times the mean value of said standard deviation.

Claim 70 (Currently Amended): An object extraction apparatus for extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, on the basis of said object image and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, comprising:

average/standard deviation calculating means for calculating a mean value and standard deviation of pixels located at same coordinates in said plurality of background images each for said pixel;

region segmentation means for dividing said object image into a plurality of regions; mean calculating means for calculating a mean value of pixels in each region of said object image;

difference means for calculating an absolute value of difference between a mean value of pixels in each region of said object image and a mean value of pixels in a region of said background image corresponding to said region;

mean difference calculating means for calculating a mean value of said absolute value of difference ~~each~~ for each said region; mean standard deviation calculating means for calculating a mean value of said standard deviation ~~each~~ for each said region; and

extraction means for extracting a region out of said plurality of regions as said object portion if a mean value of said absolute value of difference is greater than a predetermined number times the mean value of said standard deviation.

Claim 71 (Currently Amended): An object extraction apparatus for extracting an object image by removing an undesired portion from an object image on the basis of a plurality of object images obtained by shooting an object of interest a plurality of times and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, comprising:

means/standard deviation calculating means for calculating a mean value and standard deviation of pixels located at same coordinates in said plurality of background images each for said pixel;

mean calculating means for calculating a mean value of pixels located at same coordinates in said plurality of object images each for said pixel; region segmentation means for dividing said object image into a plurality of regions;

difference means for calculating an absolute value of difference between said mean value of each pixel in each region of said object image and said mean value of corresponding pixel in a region of said background image corresponding to said region;

mean difference calculating means for calculating a mean value of said absolute value of difference ~~each~~ for each said region;

mean standard deviation calculating means for calculating a mean value of said standard deviation ~~each~~ for each said region; and

extraction means for extracting a region out of said plurality of regions as said object portion if a mean value of said absolute value of difference is greater than a predetermined number times the mean value of said standard deviation.

Claim 72 (Previously Presented): An object extraction method of extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, on the basis of said object image and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, comprising the steps of:

determining statistically a threshold value according to distribution of said plurality of background images;

calculating an absolute value of difference between said object image and said background image; and

extracting a portion of said object image as said object portion if said absolute value of difference is greater than said threshold value.

Claim 73 (Previously Presented): An object extraction method of extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of the interest, on the basis of said object image and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, comprising the steps of:

calculating a mean value and standard deviation of pixels located at the same coordinates in said plurality of background images each for said pixel;

calculating an absolute value of difference between a value of each pixel in said object image and a mean value of pixels in said background image corresponding to said pixel; and

extracting a pixel out of the pixels in said object image as said object portion if said absolute value of difference is greater than a predetermined number times said standard deviation.

Claim 74 (Currently Amended): An object extraction method of extracting an object portion by removing a background portion from an object image obtained by shooting an object of interest, on the basis of said object image and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, comprising the steps of:

calculating a mean value and standard deviation of pixels located at the same coordinates in said plurality of background images each for said pixel;

dividing said object image into a plurality of regions;

calculating an absolute value of difference between a value of each pixel in each region of said object image and a mean value of corresponding pixels in a region of said background image corresponding to said region;

calculating a mean value of said absolute value of difference ~~each~~ for each said region;

calculating a mean value of said standard deviation ~~each~~ for each said region; and

extracting a region out of said plurality of regions as said object portion if said absolute values of difference is greater than a predetermined number times said standard deviation.

Claim 75 (Currently Amended): An object extraction method of extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of the interest, on the basis of said object image and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, comprising the steps of:

calculating a mean value and standard deviation of pixels located at the same coordinates in said plurality of background images each for said pixel;

dividing said object image into a plurality of regions;

calculating a mean value of pixels in each region of said object image;

calculating an absolute value of difference between a mean value of pixels in each region in said object image and a mean value of pixels in a region of said background image corresponding to said region;

calculating a mean value of said absolute value of difference ~~each~~ for each said region;

calculating a mean value of said standard deviation ~~each~~ for each said region; and

extracting a region out of said plurality of regions as said object portion if a mean value of standard deviation is greater than a predetermined number times the mean value of said standard deviation.

Claim 76 (Currently Amended): An object extraction method of extracting an object portion by removing an undesired portion from an object image on the basis of a plurality of object images obtained by shooting an object of interest a plurality of times and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, comprising the steps of:

calculating a mean value and standard deviation of pixels located at the same coordinates in said plurality of background images each for said pixel;

calculating a mean value of pixels located at the same coordinates in said plurality of object images each for said pixel;

dividing said object image into a plurality of regions; calculating an absolute value of difference between said mean value of each pixel in each region of said object image and said mean value of corresponding pixel in a region of said background image corresponding to said region;

calculating a mean value of said absolute value of difference ~~each~~ for each said region; calculating a mean value of said standard deviation ~~each~~ for each said region; and

extracting a region out of said plurality of regions as said object portion if a mean value of said absolute value is greater than a predetermined number times the mean value of said standard deviation.

Claim 77 (Previously Presented): A medium storing a program for causing a computer to extract an object portion by removing an undesired portion from an object image obtained by shooting an object of interest on the basis of said object image and a plurality of background images obtained by shooting a background of said object of interest a plurality of times, said program comprising the steps of:

determining statistically a threshold value according to distribution of said plurality of background images;

calculating an absolute value of difference between said object image and said background image; and

extracting a portion of said object image as said object portion if said absolute value of difference is greater than said predetermined value.

Claim 78 (Previously Presented): A medium storing a program for causing a computer to extract an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, on the basis of said object image and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, said program comprising the steps of:

calculating a mean value and standard deviation of pixels located at the same coordinates in said plurality of background images each for said pixel;

calculating an absolute value of difference between a value of each pixel in said object image and a mean value of pixels in said background image corresponding to said pixel; and

extracting a pixel out of the pixels in said object image as said object portion if said absolute value of difference is greater than said predetermined number times said standard deviation.

Claim 79 (Currently Amended): A medium storing a program for causing a computer to extract an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, on the basis of said object image and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, said program comprising the steps of:

calculating a mean value and standard deviation of pixels located at the same coordinates in said plurality of background images each for said pixel;

dividing said object image into a plurality of regions;

calculating an absolute value of difference between a value of each pixel in each region of said object image and a mean value of corresponding pixels in a region of said background image corresponding to said region;

calculating a mean value of said absolute value of difference ~~each~~ for each said region;

calculating a mean value of said standard deviation ~~each~~ for each said region; and
extracting a region out of said plurality of regions as said object portion if a mean value of said absolute values of difference is greater than a predetermined number times the mean value of said standard deviation.

Claim 80 (Currently Amended): A medium storing a program for causing a computer to extract an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, on the basis of said object image and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, said program comprising the steps of:

calculating a mean value and standard deviation of pixels located at the same coordinates in said plurality of background images each for said pixel;

dividing said object image into a plurality of regions;

calculating a mean value of pixels in each region of said object image;

calculating an absolute value of difference between a mean value of pixels in each region in said object image and a mean value of pixels in a region of said background image corresponding to said region;

calculating a mean value of said absolute value of difference ~~each~~ for each said region;

calculating a mean value of said standard deviation ~~each~~ for each said region; and

extracting a region out of said plurality of regions as said object portion if a mean value of said absolute value of difference is greater than a predetermined number times the mean value of said standard deviation.

Claim 81 (Currently Amended): A medium storing a program for causing a computer to extract an object portion by removing an undesired portion from an object image on the basis of a plurality of object images obtained by shooting an object of interest a plurality of times and a plurality of background

images obtained by shooting only a background of said object of interest a plurality of times, said program comprising the steps of:

- calculating a mean value and standard deviation located at the same coordinates in said plurality of background images each for said pixel;

- calculating a mean value of pixels located at the same coordinates in said plurality of object images each for said pixel;

- dividing said object image into a plurality of regions;

- calculating an absolute value of difference between said mean value of each pixel in each region of said object image and said mean value of corresponding pixel in a region of said background image corresponding to said region;

- calculating a mean value of said absolute value of difference ~~each~~ for each said region;

- calculating a mean value of said standard deviation ~~each~~ for each said region; and

- extracting a region out of said plurality of regions as said object portion if a mean value of said absolute value of difference is greater than a predetermined number times the mean value of said standard deviation.

Claims 82 – 94 (canceled).

Claim 95 (Currently Amended): An object extraction apparatus for extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, on the basis of said object image and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, comprising:

- mean/standard deviation calculating means for calculating a mean value and standard deviation of pixels located at the same coordinates in said plurality of background images each for said pixel;

- region segmentation means for dividing said object image into a plurality of regions;

mean calculating means for calculating a mean value of pixels in each region of said object image and a mean value in each region of the mean value of pixels in the background image;

difference means for calculating an absolute value of difference between a mean value of pixels within each region of said object image and a mean value in the region of pixels in a region of said background image corresponding to said region;

mean standard deviation calculating means for calculating a mean value of said standard deviation ~~each~~ for each said region; and

extraction means for extracting a region out of said plurality of regions as the object region if an absolute value of difference is greater than a predetermined number times the mean value of said standard.

Claim 96 (Currently Amended): An object extraction method of extracting an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, on the basis of said object image and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, comprising the steps of:

calculating a mean value and standard deviation of pixels located at the same coordinates in said plurality of background images each for said pixel;

dividing said object image into a plurality of regions;

calculating a mean value of pixels in each region of said object image and a mean value in each region of the mean value of the pixels in the background image;

calculating an absolute value of difference between a mean value of pixels within each region of said object image and a mean value in the region of pixels in a region of said background image corresponding to said region;

calculating a mean value of said standard deviation ~~each~~ for each said region; and

extracting a region out of said plurality of regions as the object portion if an absolute value of difference is greater than a predetermined number times the mean value of said standard deviation.

Claim 97 (Previously Presented): A medium storing a program for causing a computer to extract an object portion by removing an undesired portion from an object image obtained by shooting an object of interest, on the basis of said object image and a plurality of background images obtained by shooting only a background of said object of interest a plurality of times, comprising the steps of:

calculating a mean value and standard deviation of pixels located at the same coordinate in said plurality of background images each for said pixel; dividing said object image into a plurality of regions;

calculating a mean value of pixels in each region of said object image and a mean value in each region of the mean values of the pixels of the background image;

calculating an absolute value of difference between a mean value of pixels within each region of said object image and a mean value in the region of pixels in a region of said background image corresponding to said region;

calculating a mean value of said standard deviation ~~each~~ for each said region; and

extracting a region out of said plurality of regions as the object portion if an absolute value of difference is greater than a predetermined number times the mean value of said standard deviation.